

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference WPP87054	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/05442	International filing date (day/month/year) 12.12.2003	Priority date (day/month/year) 12.12.2002
International Patent Classification (IPC) or both national classification and IPC H01M4/80, H01M4/66, H01M4/04, H01M4/32, H01M4/48, C25D3/16, C25D3/02		
Applicant UNIVERSITY OF SOUTHAMPTON		


- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 01.04.2004	Date of completion of this report 12.04.2005
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International application No. **PCT/GB 03/05442**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-25 as originally filed

Claims, Numbers

1-17 filed with telefax on 01.03.2005

Drawings, Sheets

1/16-16/16 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-17
	No: Claims	
Inventive step (IS)	Yes: Claims	12,14-16
	No: Claims	1-10,11,13,17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations

see separate sheet

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Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: NELSON P A ET AL: "MESOPOROUS NICKEL/NICKEL OXIDE ELECTRODES FOR HIGH POWER APPLICATIONS" JOURNAL OF NEW MATERIALS FOR ELECTROCHEMICAL SYSTEMS, ECOLE POLYTECHNIQUE DE MONTREAL, MONTREAL, CA, vol. 5, no. 1, January 2002 (2002-01), pages 63-65, XP001046009 ISSN: 1480-2422
- D2: NELSON P A ET AL: "MESOPOROUS NICKEL/NICKEL OXIDE-A NANOARCHITECTURED ELECTRODE" CHEMISTRY OF MATERIALS, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 14, no. 2, February 2002 (2002-02), pages 524-529, XP001163942 ISSN: 0897-4756
- D3: US-B-6 203 9251 (GOELTNER CHRISTINE ET AL) 20 March 2001 (2001-03-20)
- D4: WO 99/00536 A (ATTARD GEORGE SIMON ; BARTLETT PHILIP NIGEL (GB); ELLIOTT JOANNE (GB);) 7 January 1999 (1999-01-07)

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **at least claims 1-10, 11 and 17 and 18** is not inventive in the sense of Article 33(3) PCT.

1. In the present case the Inventor's and/or Applicant's publications D1, D2 as well as their patent applications D3 or D4 would deprive novelty for the cell structure as defined in said claims for the following reasons:
2. **D1** discloses (see "2. Experimental", p.63) the application of a method for hexagonal lattice mesoporous Ni/Ni-oxide electrodes not different to the one disclosed in the description (example 9(ii)) according to the present application. Given the geometrical characteristics on the porosity as given in p.64, "Results and discussion", the produced electrodes comprise Ni, Ni-oxide and "a few monolayers" of NiOOH, i.e. the most preferable substances according to the present application (p.3, l.20). Direct reference to the use of such an electrode is done in D1 (p.65, item 4,

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penultimate and ultimate sentence) in supecapacitor devices and as current collector in "alkaline solution" which imply at least another electrode and an electrolyte. Furthermore, at least in the experimental phase of the thus produced electrode of D1, tests were performed under "cell conditions".

Therefore, at least the subject-matter of **claims 1-6,9,10 and 17** insofar the cell is concerned is not novel though the direct disclosure of D1.

Furthermore, the subject-matter of **claims 7 and 8** is also not considered novel in an implicit way, since the same manufacturing method of the electrode(s) would provide the same properties as those disclosed in said claims.

In **D2** (p.525, experimental section) it appears that the same type of experiments was performed with both Brij 56 and 78 surfactants, producing (p.527) hexagonal mesoporous structures of Ni and Ni hydroxides having pores of same size (p.525) taking into account the center to center pore spacing. Reference is also given (in the same passage of left column of p.525) to mesoporous Co structures. Thus novelty cannot be acknowledged for the cell construction of the claims as previously referred.

In **D3** at least a metal oxide of preferably platinum or nickel, palladium, gold or a combination of the above is formed by the known templating method for anodic or cathodic electrode applications (col.6, l.4-7) having the claimed porous structure and size (col.4, l.32-52).

Thus the cell structure of **claims 1,2,4,5-10, and 17** is not novel.

It appears also that the subject-matter of **claim 3** it is also implicitly disclosed because not a different from the claimed method is used in D3.

The same objection as above appears valid in view of the document **D4**, in particular the examples 1,5-9,11,12.

2. Dependent (upon "any preceding claim") **claims 11 and 13** relate to the negative electrode construction (cl.11) and to the nature (cl.13) of the same.
It is to be noted that claim 11 cannot be delimited by the use of a known electrode as a negative or a positive one given that duplication of said known electrodes in a cell structure under the features as defined in the combined embodiment of claims 1 and 11 (i.e. without any characteristic on the material (metal) nature) would not provide an

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inventive step (Art 33(3) PCT).

On the other part, cell and electrodes features should be correctly delimited to the combination of materials credibly tested in the application as filed.

The application (claims) is not delimited to those features sufficiently disclosed and being able to distinguish them from the cited documents.

The mere integration of the "portable electronic device" in the subject matter of claims can formally render novel the claims, however, the use in general of cells in portable electronic devices cannot substantiate an inventive activity.

For all the above reasons, the application does not conform with the provisions of Art.33(3) PCT.